Review worksheets

SL 2 and PC 1

Reviews: SL 2/PC 1 Name Key Team Per.

1) Find the equation of the line through (6,-7) that is perpendicular to the line through (4,-11) and (1,5).

$m = \frac{-11-5}{4-1} = -\frac{16}{3}$ $m_\perp = \frac{3}{16}$

* Use point-slope form!

$y+7 = \frac{3}{16}(x-6)$

2) Solve for x. Give exact, simplified answers.

a) $3x^2 + 2x = 2$

$3x^2 + 2x - 2 = 0$

$x = \frac{-2 \pm \sqrt{4-4(3)(-2)}}{2(3)}$

$x = \frac{-2}{6} \pm \frac{2\sqrt{7}}{6}$

$x = -\frac{1}{3} \pm \frac{\sqrt{7}}{3}$

b) $5x^2 - 19x - 4 < 0$

$(5x + 1)(x - 4) < 0$

$-\frac{1}{5} < x < 4$

c) $|3x + 2| \geq 15$

$3x + 2 \leq -15$ or $3x + 2 \geq 15$

$3x \leq -17$ $3x \geq 13$

$x \leq -\frac{17}{3}$ or $x \geq \frac{13}{3}$

d) $5 - 2(x+8) = -6x + 8 + 5x$

$5 - 2x - 16 = -x + 8$

$-2x - 11 = -x + 8$

$-x = 19$

$x = -19$

e) $ax - 3ab = b(a-x)$

$ax - 3ab = ab - bx$

$ax + bx = 4ab$

$\frac{x(a+b)}{(a+b)} = \frac{4ab}{(a+b)}$

$\boxed{x = \frac{4ab}{a+b}}$

f) $-3 < \frac{6-10x}{5} \leq 7$

$-15 < 6 - 10x \leq 35$

$-21 < -10x \leq 29$

$\frac{21}{10} > x \geq -\frac{29}{10}$

$\boxed{-\frac{29}{10} \leq x < \frac{21}{10}}$

3) Solve the system: $2x - y + 3z = -13$

$15x + 7y + 4z = 4$

$-6x - 5y - z = -17$

rref: $\begin{bmatrix} 1 & 0 & 0 & -3 \\ 0 & 1 & 0 & 7 \\ 0 & 0 & 1 & 0 \end{bmatrix}$ $\boxed{(-3, 7, 0)}$

4) Find the distance between the points of intersection of $y = -3x + 11$ and $y = x^2 + 3x - 5$. Give exact, simplified answer.

find intersections:

$x^2 + 3x - 5 = -3x + 11$

$x^2 + 6x - 16 = 0$

$(x+8)(x-2) = 0$

$x = -8, 2$

$y = -3(-8) + 11 \rightarrow (-8, 35)$

$y = -3(2) + 11 \rightarrow (2, 5)$

$d = \sqrt{(-8-2)^2 + (35-5)^2}$

$d = \sqrt{100 + 900}$

$d = \sqrt{1000}$

$\boxed{= 10\sqrt{10}}$

5. Simplify:

a) $\frac{(x-6)5}{(x-6)(x+1)} - \frac{2x}{(x-6)(x+1)}$

$\frac{5x - 30 - 2x}{(x-6)(x+1)}$

$\boxed{\frac{3(x-10)}{(x-6)(x+1)}}$

b) $\frac{8}{4-3\sqrt{2}} \cdot \frac{4+3\sqrt{2}}{4+3\sqrt{2}}$

$\frac{8(4+3\sqrt{2})}{(4)^2 - (3\sqrt{2})^2}$

$\frac{8(4+3\sqrt{2})}{16 - 9(2)}$

$\frac{8(4+3\sqrt{2})}{-2} \rightarrow \boxed{-4(4+3\sqrt{2})}$

c) $\frac{x-y}{x^2-y^2} \div \frac{x^2+y^2}{x^3+y^3}$

$\frac{(x-y)}{(x+y)(x-y)} \cdot \frac{(x+y)(x^2-xy+y^2)}{(x^2+y^2)}$

$\boxed{\frac{x^2-xy+y^2}{x^2+y^2}}$

d) $\sqrt[4]{8x^5y^{19}} = \sqrt[4]{8x^4 \cdot x (y^4)^4 \cdot y^3}$

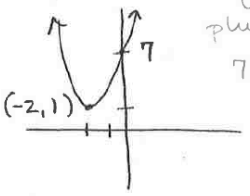
$\boxed{= |x| y^4 \sqrt[4]{8xy^3}}$

e) $\sqrt[3]{-40x^5}$

$\sqrt[3]{(-8)(5)x^3 \cdot x^2}$

$\boxed{-2x\sqrt[3]{5x^2}}$

6. Find the equation for the parabola: $y = a(x+2)^2 + 1$



plug in $(0,7)$

$7 = a(0+2)^2 + 1$

$6 = 4a$

$a = \frac{3}{2}$

$$y = \frac{3}{2}(x+2)^2 + 1$$

7. Find the values of b such that the line $y = 6x + b$ and the parabola $y = x^2 - 4x + 1$ have:

combined equation: $x^2 - 4x + 1 = 6x + b$

$x^2 - 10x + (1-b) = 0$

a) 2 points of intersection $b^2 - 4ac > 0$

$(-10)^2 - 4(1)(1-b) > 0$

$100 - 4 + 4b > 0$

$4b > -96$

$b > -24$

b) 1 point of intersection $b^2 - 4ac = 0$ $\quad b = -24$

c) No points of intersection $b^2 - 4ac < 0$ $\quad b < -24$

Precalculus Review Name Key

Day 2

Perform the indicated operation and simplify.

1. $\frac{(x+2)}{(x+2)}\frac{1}{(x-1)} - \frac{1-x}{x^2+x-2}$ $\quad (x+2)(x-1)$

$\frac{x+2-1+x}{(x+2)(x-1)}$

$$\frac{2x+1}{(x+2)(x-1)}$$

2. $\frac{3}{x-2} + \frac{5(-1)}{(2-x)(-1)}$

$\frac{3}{x-2} - \frac{5}{x-2}$

$$\frac{-2}{x-2}$$

3. $\frac{(x-1)}{(x-1)} \cdot \frac{2}{x^2-4} - \frac{1}{x^2-3x+2} \cdot \frac{(x+2)}{(x+2)}$

$(x+2)(x-2) \quad (x-2)(x-1)$

$\frac{2x-2-x-2}{(x-1)(x+2)(x-2)} = \frac{x-4}{(x-1)(x+2)(x-2)}$

Simplify.

4. $\sqrt{x^2}$ $\quad |x|$

5. $\sqrt{x^3}$ $\quad |x|\sqrt{x}$

6. $\sqrt{x^4}$ $\quad x^2$

7. $\sqrt{27x^5y^6}$ $\quad 3x^2|y^3|\sqrt{3x}$

For # 8-9, the given lines are perpendicular. Find the value of c.

8. $cx - y + 2 = 0$
$-3x + 4y - c = 0$

$\frac{4y}{4} = \frac{3x}{4} + \frac{c}{4}$

$y = \frac{c}{4}x + 2$

$m\perp = -\frac{4}{3}$

$c = -\frac{4}{3}$

9. $cx - 2y + 14 = 0$
$x + 2y - c = 0$

$\frac{2y}{2} = \frac{c}{2}x + \frac{14}{2}$

$\frac{2y}{2} = \frac{-1}{2}x + \frac{c}{2}$

$y = \frac{c}{2}x + 7$

$m\perp = 2$

$\frac{c}{2} = 2$

$c = 4$

10. Find the distance between the points of intersection of the line $y = 2x - 3$, and the parabola $y = x^2 - 3x - 17$.

$x^2 - 3x - 17 = 2x - 3$

$x^2 - 5x - 14 = 0$

$(x - 7)(x + 2) = 0$

$x = 7, -2$

for $x = 7$
$y = 2(7) - 3$
$y = 11$
$(7, 11)$

for $x = -2$
$y = 2(-2) - 3$
$y = -7$
$(-2, -7)$

$d = \sqrt{(7+2)^2 + (11+7)^2}$

$= \sqrt{81 + 324}$

$= \sqrt{405}$

$d = 9\sqrt{5}$

You are ready!